

Conoco Phillips Company

Arapahoe County, Colorado

Sec. 25-T4S-R64W

Murphy Family 4-64-25-1H

Plan A

Survey: Actual MWD Surveys (Sidetrack 2)

Job No. Actual MWD Survey's (Sidetrack 1)

Sperry Drilling Services

Standard Report

, 14 April, 2013

Well Coordinates: 1,673,592.00 N, 3,279,071.89 E (39° 40' 43.06" N, 104° 30' 30.58" W)

Ground Level: 5,822.00 ft

Local Coordinate Origin:

Centered on Well Murphy Family 4-64-25-1H

Viewing Datum:

RKB 24 ft @ 5846.00ft (H&P 280)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Version: 2003.16 Build: 431

HALLIBURTON

Survey Report for Murphy Family 4-64-25-1H - Actual MWD Surveys (Sidetrack 2)

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vert Sec (ft) |
|---------------------------|--------------------|----------------|---------------------------|---------------|---------------|---------------------|
| 6,846.00 | 1.06 | 87.03 | 6,844.68 | 8.65 | -16.12 | |
| 6,998.00 | 12.43 | 99.44 | 6,995.38 | 6.03 | 1.48 | |
| 7,030.00 | 12.21 | 99.18 | 7,026.65 | 4.93 | 8.22 | |
| 7,062.00 | 11.64 | 100.16 | 7,057.96 | 3.82 | 14.74 | |
| 7,093.00 | 12.68 | 96.86 | 7,088.26 | 2.86 | 21.19 | |
| 7,125.00 | 15.03 | 92.92 | 7,119.33 | 2.23 | 28.82 | |
| 7,157.00 | 18.01 | 92.31 | 7,150.00 | 1.82 | 37.91 | |
| 7,189.00 | 20.81 | 91.58 | 7,180.18 | 1.46 | 48.54 | |
| 7,220.00 | 22.68 | 92.87 | 7,208.97 | 1.01 | 60.01 | |
| 7,252.00 | 25.39 | 94.06 | 7,238.20 | 0.22 | 73.02 | |
| 7,284.00 | 28.76 | 94.35 | 7,266.69 | -0.85 | 87.55 | |
| 7,315.00 | 32.16 | 94.82 | 7,293.40 | -2.11 | 103.21 | |
| 7,347.00 | 35.44 | 95.36 | 7,319.99 | -3.70 | 120.94 | |
| 7,378.00 | 39.26 | 95.88 | 7,344.63 | -5.54 | 139.65 | |
| 7,410.00 | 42.87 | 96.40 | 7,368.75 | -7.79 | 160.55 | |
| 7,442.00 | 45.67 | 95.75 | 7,391.66 | -10.15 | 182.76 | |
| 7,473.00 | 48.34 | 95.07 | 7,412.80 | -12.29 | 205.33 | |
| 7,505.00 | 50.76 | 94.74 | 7,433.56 | -14.37 | 229.59 | |
| 7,537.00 | 53.56 | 95.40 | 7,453.19 | -16.61 | 254.76 | |
| 7,568.00 | 57.08 | 96.16 | 7,470.83 | -19.18 | 280.11 | |
| 7,600.00 | 60.70 | 96.35 | 7,487.36 | -22.16 | 307.34 | |
| 7,632.00 | 65.07 | 96.19 | 7,501.94 | -25.27 | 335.65 | |
| 7,663.00 | 68.50 | 96.36 | 7,514.16 | -28.38 | 363.96 | |
| 7,695.00 | 71.60 | 96.25 | 7,525.08 | -31.69 | 393.86 | |
| 7,726.00 | 74.16 | 96.15 | 7,534.20 | -34.89 | 423.31 | |
| 7,758.00 | 76.39 | 96.05 | 7,542.33 | -38.17 | 454.08 | |
| 7,790.00 | 78.77 | 95.95 | 7,549.22 | -41.44 | 485.16 | |
| 7,821.00 | 82.04 | 95.85 | 7,554.38 | -44.58 | 515.56 | |
| 7,848.00 | 84.68 | 95.77 | 7,557.50 | -47.30 | 542.24 | |
| 7,972.00 | 90.49 | 95.40 | 7,562.73 | -59.35 | 665.49 | |
| 8,012.00 | 91.24 | 95.44 | 7,562.12 | -63.13 | 705.30 | |
| 8,044.00 | 91.36 | 95.41 | 7,561.40 | -66.15 | 737.15 | |
| 8,107.00 | 91.11 | 97.75 | 7,560.04 | -73.37 | 799.72 | |
| 8,139.00 | 90.86 | 97.71 | 7,559.49 | -77.67 | 831.42 | |
| 8,170.00 | 91.24 | 97.73 | 7,558.92 | -81.83 | 862.14 | |
| 8,202.00 | 92.29 | 98.11 | 7,557.93 | -86.24 | 893.82 | |
| 8,234.00 | 92.29 | 98.02 | 7,556.66 | -90.73 | 925.47 | |
| 8,329.00 | 93.28 | 97.93 | 7,552.04 | -103.89 | 1,019.44 | |
| 8,360.00 | 93.40 | 97.82 | 7,550.23 | -108.13 | 1,050.10 | |
| 8,392.00 | 92.22 | 97.46 | 7,548.67 | -112.38 | 1,081.78 | |
| 8,455.00 | 90.19 | 96.30 | 7,547.34 | -119.93 | 1,144.30 | |
| 8,518.00 | 89.94 | 95.90 | 7,547.27 | -126.62 | 1,206.95 | |
| 8,582.00 | 90.49 | 96.64 | 7,547.03 | -133.61 | 1,270.56 | |
| 8,613.00 | 90.49 | 96.72 | 7,546.76 | -137.22 | 1,301.35 | |
| 8,708.00 | 90.19 | 96.83 | 7,546.20 | -148.42 | 1,395.69 | |
| 8,803.00 | 90.43 | 96.78 | 7,545.69 | -159.68 | 1,490.01 | |

| | | | | | |
|----------|-------|-------|----------|---------|----------|
| 8,898.00 | 90.62 | 96.44 | 7,544.82 | -170.61 | 1,584.38 |
| 8,993.00 | 91.05 | 96.13 | 7,543.43 | -181.01 | 1,678.80 |
| 9,088.00 | 90.06 | 95.79 | 7,542.51 | -190.88 | 1,773.28 |
| 9,120.00 | 90.19 | 95.86 | 7,542.44 | -194.12 | 1,805.11 |

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vert Sec (ft) |
|---------------------------|--------------------|----------------|---------------------------|---------------|---------------|---------------------|
| 9,183.00 | 89.57 | 95.88 | 7,542.57 | -200.57 | 1,867.78 | |
| 9,278.00 | 90.37 | 95.77 | 7,542.62 | -210.21 | 1,962.29 | |
| 9,373.00 | 89.57 | 96.24 | 7,542.67 | -220.15 | 2,056.77 | |
| 9,468.00 | 89.51 | 96.11 | 7,543.44 | -230.37 | 2,151.21 | |
| 9,563.00 | 90.06 | 97.29 | 7,543.79 | -241.45 | 2,245.56 | |
| 9,657.00 | 89.88 | 97.02 | 7,543.84 | -253.16 | 2,338.83 | |
| 9,752.00 | 89.63 | 96.89 | 7,544.25 | -264.66 | 2,433.13 | |
| 9,847.00 | 89.32 | 97.34 | 7,545.12 | -276.43 | 2,527.40 | |
| 9,942.00 | 90.74 | 97.30 | 7,545.07 | -288.53 | 2,621.62 | |
| 10,037.00 | 90.56 | 97.38 | 7,543.99 | -300.67 | 2,715.83 | |
| 10,132.00 | 90.62 | 97.41 | 7,543.01 | -312.89 | 2,810.04 | |
| 10,227.00 | 89.69 | 97.01 | 7,542.75 | -324.82 | 2,904.29 | |
| 10,322.00 | 90.62 | 97.50 | 7,542.50 | -336.81 | 2,998.52 | |
| 10,417.00 | 91.36 | 98.15 | 7,540.86 | -349.75 | 3,092.62 | |
| 10,512.00 | 91.85 | 98.59 | 7,538.20 | -363.57 | 3,186.57 | |
| 10,606.00 | 91.11 | 97.13 | 7,535.77 | -376.42 | 3,279.66 | |
| 10,638.00 | 91.36 | 97.18 | 7,535.08 | -380.40 | 3,311.40 | |
| 10,701.00 | 89.81 | 95.76 | 7,534.43 | -387.50 | 3,373.99 | |
| 10,796.00 | 89.38 | 95.18 | 7,535.11 | -396.56 | 3,468.56 | |
| 10,891.00 | 89.81 | 95.40 | 7,535.78 | -405.32 | 3,563.15 | |
| 10,986.00 | 91.17 | 96.03 | 7,534.97 | -414.77 | 3,657.67 | |
| 11,018.00 | 91.05 | 95.78 | 7,534.35 | -418.07 | 3,689.50 | |
| 11,081.00 | 90.49 | 94.96 | 7,533.50 | -423.96 | 3,752.21 | |
| 11,113.00 | 90.68 | 94.98 | 7,533.17 | -426.73 | 3,784.09 | |
| 11,207.00 | 93.52 | 95.58 | 7,529.73 | -435.38 | 3,877.62 | |
| 11,271.00 | 93.71 | 95.60 | 7,525.69 | -441.60 | 3,941.19 | |
| 11,366.00 | 92.97 | 95.55 | 7,520.16 | -450.81 | 4,035.58 | |
| 11,460.00 | 91.79 | 95.72 | 7,516.25 | -460.03 | 4,129.04 | |
| 11,555.00 | 87.84 | 95.34 | 7,516.56 | -469.19 | 4,223.58 | |
| 11,619.00 | 88.76 | 95.56 | 7,518.46 | -475.26 | 4,287.26 | |
| 11,650.00 | 88.89 | 95.72 | 7,519.10 | -478.31 | 4,318.10 | |
| 11,745.00 | 90.80 | 95.92 | 7,519.35 | -487.94 | 4,412.61 | |
| 11,777.00 | 90.87 | 96.13 | 7,518.89 | -491.30 | 4,444.43 | |
| 11,840.00 | 90.19 | 95.70 | 7,518.30 | -497.79 | 4,507.09 | |
| 11,849.00 | 89.69 | 95.78 | 7,518.31 | -498.69 | 4,516.05 | |
| 11,909.00 | 89.50 | 95.78 | 7,518.74 | -504.73 | 4,575.74 | |

PROJECTION TO BIT

Survey Annotations

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | +E/-W (ft) | Comment |
|---------------------------|---------------------------|------------------------------------|---------------|-------------------|
| 11,909.00 | 7,518.74 | -504.73 | 4,575.74 | PROJECTION TO BIT |

Vertical Section Information

| Angle Type | Target | Azimuth | Origin Type | +N/-S | Origin +E/-W | Start TVD |
|---------------|--------|---------|----------------|-------|-----------------|--------------|
|---------------|--------|---------|----------------|-------|-----------------|--------------|

| | | (°) | (ft) | (ft) | (ft) |
|------|----------------------|------------|------|------|------|
| User | No Target (Freehand) | 0.00 Slot | 0.00 | 0.00 | 0.00 |
| User | No Target (Freehand) | 96.43 Slot | 0.00 | 0.00 | 0.00 |

Survey tool program

| From (ft) | To (ft) | Survey/Plan | S |
|--------------|------------|-----------------------------------|-----|
| 7,094.00 | 7,433.00 | Actual MWD Survey's (Sidetrack 1) | MWD |

Targets

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) |
|---|---------------------|-----------------|-------------|---------------|---------------|------------------|-----------------|
| Murphy Family 4-64-2 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 1,673,592.01 | 3,279,071.89 |
| - survey misses target center by 6844.70ft at 6846.00ft MD (6844.68 TVD, 8.65 N, -16.12 E) | | | | | | | |
| - Polygon | | | | | | | |
| Murphy Family 4-64-2 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 1,673,592.01 | 3,279,071.89 |
| - survey misses target center by 6844.70ft at 6846.00ft MD (6844.68 TVD, 8.65 N, -16.12 E) | | | | | | | |
| - Polygon | | | | | | | |
| Murphy Family 4-64-2 | 0.00 | 0.00 | 7,514.00 | -515.73 | 4,576.20 | 1,673,126.24 | 3,283,653.45 |
| - survey misses target center by 11.98ft at 11909.00ft MD (7518.74 TVD, -504.73 N, 4575.74 E) | | | | | | | |
| - Point | | | | | | | |

Conoco Phi

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Arapahoe Cc

North Reference Sheet for Sec. 25-T4S-R64W - Murphy Family 4-64-25-1H - Plan 1

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB 24 ft @ 5846.00ft (H&P 280). Northing and Easting are relative to Murphy Family 4-64-25-1H

Coordinate System is US State Plane 1983, Colorado Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99998666

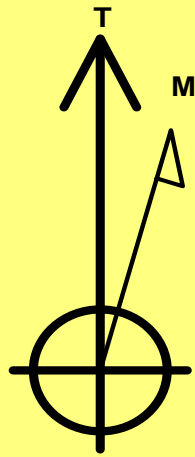
Grid Coordinates of Well: 1,673,592.00 ft N, 3,279,071.89 ft E

Geographical Coordinates of Well: 39° 40' 43.06" N, 104° 30' 30.58" W

Grid Convergence at Surface is: 0.63°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,909.00ft

Magnetic Convergence at surface is: -7.87° (28 March 2013, , BGGM2012)



Magnetic Model: BGGM2012
Date: 28-Mar-13
Declination: 8.49°
Inclination/Dip: 66.43°
Field Strength: 52487

Grid North is 0.63° East of True North (Grid Convergence)
Magnetic North is 8.49° East of True North (Magnetic Declination)
Magnetic North is 7.87° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.63°
To convert a Magnetic Direction to a True Direction, Add 8.49° East
To convert a Magnetic Direction to a Grid Direction, Add 7.87°

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| ical tion t) | Dogleg Rate (°/100ft) |
|--------------------|-----------------------------|
| -16.99 | 0.00 |
| 0.79 | 7.50 |
| 7.61 | 0.71 |
| 14.22 | 1.89 |
| 20.74 | 4.03 |
| 28.39 | 7.91 |
| 37.47 | 9.33 |
| 48.07 | 8.78 |
| 59.52 | 6.23 |
| 72.54 | 8.60 |
| 87.09 | 10.54 |
| 102.80 | 10.99 |
| 120.59 | 10.29 |
| 139.39 | 12.36 |
| 160.41 | 11.33 |
| 182.74 | 8.86 |
| 205.41 | 8.76 |
| 229.75 | 7.60 |
| 255.01 | 8.90 |
| 280.50 | 11.53 |
| 307.89 | 11.32 |
| 336.37 | 13.66 |
| 364.85 | 11.08 |
| 394.93 | 9.69 |
| 424.55 | 8.26 |
| 455.50 | 6.98 |
| 486.75 | 7.44 |
| 517.31 | 10.55 |
| 544.12 | 9.78 |
| 667.95 | 4.69 |
| 707.94 | 1.88 |
| 739.92 | 0.39 |
| 802.90 | 3.73 |
| 834.89 | 0.79 |
| 865.88 | 1.23 |
| 897.85 | 3.49 |
| 929.81 | 0.28 |
| 1,024.66 | 1.05 |
| 1,055.60 | 0.52 |
| 1,087.56 | 3.85 |
| 1,150.54 | 3.71 |
| 1,213.53 | 0.75 |
| 1,277.53 | 1.44 |
| 1,308.53 | 0.26 |
| 1,403.53 | 0.34 |
| 1,498.52 | 0.26 |

| | |
|----------|------|
| 1,593.52 | 0.41 |
| 1,688.51 | 0.56 |
| 1,783.50 | 1.10 |
| 1,815.50 | 0.46 |

| ical tion t) | Dogleg Rate (°/100ft) |
|--------------------|-----------------------------|
|--------------------|-----------------------------|

| | |
|----------|------|
| 1,878.49 | 0.98 |
| 1,973.49 | 0.85 |
| 2,068.48 | 0.98 |
| 2,163.48 | 0.15 |
| 2,258.48 | 1.37 |
| 2,352.47 | 0.35 |
| 2,447.46 | 0.30 |
| 2,542.45 | 0.58 |
| 2,637.44 | 1.50 |
| 2,732.42 | 0.21 |
| 2,827.40 | 0.07 |
| 2,922.39 | 1.07 |
| 3,017.38 | 1.11 |
| 3,112.34 | 1.04 |
| 3,207.25 | 0.69 |
| 3,301.18 | 1.74 |
| 3,333.17 | 0.80 |
| 3,396.16 | 3.34 |
| 3,491.15 | 0.76 |
| 3,586.13 | 0.51 |
| 3,681.11 | 1.58 |
| 3,713.11 | 0.87 |
| 3,776.09 | 1.58 |
| 3,808.08 | 0.60 |
| 3,901.98 | 3.09 |
| 3,965.85 | 0.30 |
| 4,060.68 | 0.78 |
| 4,154.59 | 1.27 |
| 4,249.55 | 4.18 |
| 4,313.52 | 1.48 |
| 4,344.51 | 0.66 |
| 4,439.50 | 2.02 |
| 4,471.49 | 0.69 |
| 4,534.49 | 1.28 |
| 4,543.49 | 5.63 |
| 4,603.48 | 0.32 |

Survey Tool

| Latitude | Longitude |
|------------------|-------------------|
| 39° 40' 43.061 N | 104° 30' 30.578 W |
| 39° 40' 43.061 N | 104° 30' 30.578 W |
| 39° 40' 37.960 N | 104° 29' 32.050 W |

Ellips Company

ounty, Colorado

A

the Bottom Hole Displacement is 4,603.49ft in the Direction of 96.29° (True).

COMPASS

